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One of the interesting subjects discussed by Dr. Weingart is the dactyloscopic, or finger-print, system of identification of criminals. This system was first introduced into Great Britain and her colonies in 1901. Dresden has recently adopted it, and it is the opinion of the author that its great advantages over the Bertillon system will soon relegate the latter to a secondary or merely auxiliary position.

The development of the fire department and a discussion of its present position, as shown by the municipal exposition, are given by Brandmeister Mittmann.

A valuable discussion of the bookkeeping necessary for a municipality which undertakes large business enterprises, by Dr. Kuhfahl, follows.

The presentation of methods and data of the statistical departments, by Dr. Seutemann, shows the importance of such departments in municipal administration. The treatment is hardly adequate in all points, though the article is suggestive.

The second volume is a worthy supplement to the first, containing over eight hundred reproductions of views, plans, sketches, diagrams, and statistical tables and charts from the exposition — the major part of them being published here for the first time.

Several studies of German municipal conditions have appeared in this country — some more carefully prepared than others; but here we have an authoritative work by trained men who are students of the practical affairs of city government and all that pertains thereto. Each, dealing with his own department, gives us a presentation of German problems and of the German way of dealing with them. The Dresden exposition gave these specialists an unexcelled opportunity to make comparative studies of material which up to that time was inaccessible or nearly so.

The book is by no means ephemeral because it commemorates an exposition, for it deals with specific, living, important problems.

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Psychology: An Introductory Study of the Structure and Function of Human Consciousness. By JAMES ROWLAND ANGELL, Head of the Department of Psychology in the University of Chicago. New York: Henry Holt & Co., 1904. Pp. vii + 402. \$1.50.

The book under consideration is one which fills a very genuine and widely felt need in the psychological world. Its great merit can

be stated in a word. It is a treatise sufficiently elementary to be used as a textbook for an introductory class, which succeeds in co-ordinating the outcome of the analysis of the content of consciousness with the functional interpretation of those contents which alone can give them rational organization and meaning. The failure of previous textbooks to accomplish this end satisfactorily has been largely due to the transitional stage of the subject itself. The stress of psychological activity, and the most striking and definite results obtained up to within a very recent period, have been in the realm of the analysis of the content of consciousness. So true is this that there is in many quarters a tendency to regard a complete statement of content as the only goal of psychology. It is only with the growing importance of the conception of evolution, involving, as it does, the idea of a human individual as an organism in vital relationship with its environment, that the necessity for interpreting the products of psychological analysis in the light of the functions of the organism in which they play a part has been generally recognized. The textbooks, representing, as they do, the best-established and most thoroughly organized phases of the subject, have laid so much stress on content analysis, especially in the field of cognition, where it has been most complete, that the occasional suggestions of a functional standpoint have left the poor beginner wondering what possible connection there could be between such facts as sensation, perception, memory, or imagination, and the notion of an organism adapting itself to an environment. It is exactly this connection which the present textbook makes. The fortunate student of the future who is brought up on it will end his introductory work with a unified view of the structure and function of consciousness which has come to most of the previous generation only after a considerable period of additional work. Even an instructor who appreciates the fundamental importance of the functional point of view, and endeavors to impart it to his class, finds himself very much hampered by being obliged to use a textbook based chiefly on a content analysis.

In his preface the author acknowledges his indebtedness to both James and Dewey. The influence of Dewey is most evident in the general standpoint, and that of James in many of the details of treatment. In comparison with James's classic textbook, it has, however, two advantages—in its completeness and in its systematic unity. The affective processes, which James nowhere mentions, here receive due treatment, and many minor omissions in the older text-

book are filled in. It produces nothing of the impression which even those of us who are ardent admirers of James must deplore, that each chapter is a treatise upon a separate subject only distantly related to the others. The unity of all conscious processes is made a central idea in the treatment of each one.

The plan of the book is not new, but it is one which is well adapted to bring out the point of view from which it is written. The first two chapters, on the "Problems and Methods of Psychology" and on "The Psycho-physical Organism and the Nervous System," are introductory. The main subdivisions of the subject-matter proper are as follows: chaps. 3 and 4 contain a general discussion of the nature of consciousness and its relation to neural action; chaps. 5-12 deal with cognitive processes; chaps. 13 and 14 have to do with the affective aspect of consciousness; chaps. 15-22 are concerned with the conative aspect, including emotion; and the final chapter, 23, is a discussion of the self. A definite order of presentation is followed in each chapter. It may be stated in the author's own words thus:

We have made it a general practice to begin our study of a given mental process by analyzing its more conspicuous and characteristic features, and then, with this as a starting-point, we have turned back to trace, wherever we could, the genesis and function of the process in the individual, or in the race (p. 340).

The fundamental point of view, which is consistently elaborated throughout the rest of the book, is simply and clearly stated in the first two chapters of the *Psychology* proper, chap. 3 on the "General Relations of Consciousness to Neural Action," and chap. 4 on "Attention, Discrimination, and Association." It is in brief as follows: Consciousness is the device by means of which the organism is able to bring about new co-ordinations whenever the old ones become inadequate. In so far as adaptations are perfect, they involve no consciousness, but are purely automatic or reflex acts. In any given situation involving consciousness there are certain forms of reaction (at the outset merely the inherited ones) which can be brought to bear, but they need reorganization in order to fulfil successfully the demand made upon the organism. It is at the point where the organized reactions fail and need modification that consciousness appears. Its nature is determined by the sort of obstacle to be overcome. The first of the two chapters under discussion deals with habit, or the organized aspect of adaptation, while the second is concerned with the attentive, or organizing side.

The point which calls for special mention in the author's excellent treatment of habit is the very clear and simple exposition of the nature of the process by which the successful portion of the more or less random reaction to a stimulus which always characterizes the early stages of the formation of a habit, gets selected and impressed upon the organism, while the nonessential portions gradually disappear. His statement of it is that the successful movement is the one which reinforces the stimulus which is absorbing attention. This reinforcement in turn maintains the movement. The two experiences thus stand out more vividly in consciousness than any of the accompanying ones, and in this way become associated. The gradual disappearance of the superfluous movements is accounted for by the fact that, as the new pathway becomes firmly established, it is increasingly able to carry off all the nervous discharge occasioned by the stimulus. This theory is a very decided advance over the vague formula that the pleasure of the successful reaction serves to stamp it into the nervous system. Baldwin almost hits this formulation in his *Mental Development*, but fails to mention the fact that it is the vividness of the two experiences which accounts for their association.

The chapter on attention seems to the reviewer one of the most admirable, as well as one of the most important, in the book. "Attention" is defined as merely a name for the operation of the central and most active portion of the field of consciousness. The point in the adaptation at which most activity of consciousness is centered is always the point of greatest stress and failure in the adaptation. The various problems with regard to attention are taken up in turn, and discussed in the light of its functional significance. Its teleological nature is evident from the fact that it always occurs as a means to accomplishing some given end for the organism. The author's analysis of attention resolves it into the three forms recognized by Stout—voluntary, involuntary, and non-voluntary or spontaneous. Like Stout, he rejects the misleading term "passive attention" on the ground that all attention is essentially active. His important addition to Stout's treatment of the topic consists in his functional explanation of the three forms of attention. Spontaneous attention is fundamental and represents the inherited reactions of early infancy and the effortless acts of attention throughout life. Both voluntary and involuntary attention involve the presence of an intention to attend, and imply previous

experience. Involuntary attention is merely the case in which the deeply rooted primitive forms of reaction assert themselves in spite of the presence of later acquired tendencies. The brief duration of attention has its functional significance in the fact that attention is the conscious phase of some particular adaptation which as a single act could last but a short time. Since only one situation at a time can be dealt with, attention must be a unified function. Genuine distribution is impossible, but the situation may be a complex one, involving a complex state of consciousness. Finally, the intimate relation between attention and the processes of discrimination and association is brought out by showing that they are merely the analytic and synthetic phases of the act of attention.

The treatment of cognition begins with sensations, including a description of the sense-organs, and then passes on to discuss perception in general, perceptions of time and space, imagination, memory, conception, and reasoning. The separate treatment usually accorded to association in this connection is omitted, because association itself is regarded as one of the aspects of attention, while its results are merely neural habit. Its function is explained in connection with each of the cognitive processes in which it plays a part. The distinctive feature in these chapters is found in the application of the functional standpoint from which the book is written to each of the forms of cognition. While the purely content analysis is not in the least neglected, there is in addition a functional explanation in terms of the particular sort of need on the part of the organism which called each form into existence. The chapters on conception and reasoning go more deeply into the problem of the nature of the judgment, and its relation to conception and to inductive and deductive inference, than is usual in an introductory textbook. While these portions would doubtless be somewhat difficult for the beginner, they form a valuable introduction to the problems of logic.

The discussion of the affective processes is becomingly conservative, in view of the chaotic condition still existing in the psychological formulations of affection. The view presented is the one which has the largest following at present: that affection is a content element of consciousness having but two qualities, agreeableness and disagreeableness. There is, however, no dogmatizing on the subject. The author frankly states that he is following "the indication of the facts best established today, with a mental willingness to rehabilitate the conception whenever it may become conclusively inadequate" (p. 260).

The first three chapters of the section on conation deal with reflex, instinctive, and automatic acts; the next two, with emotion; and the last three, with volitional action. The emotions are included in this section, rather than in the preceding one on affective processes, because the author adopts a modified version of the James-Lange theory of the emotions, and is therefore logically forced to deal with the simpler forms of action before discussing emotion. The treatment of the emotions does justice to their affective aspect, and further modifies James's formulation by adopting Dewey's view that emotion is constituted, not by a mere instinctive reaction which is felt, but by the conflict between two or more possible instinctive reactions. The sketch of the development of volition is exceedingly clear and convincing, and serves to emphasize the unity of conscious processes with reference to activity. The experience of effort is explained as an emotion, rather than as a psychic force, and the freedom of the will is made to depend not upon the amount of effort which may be exerted in any given case, but on the successful co-ordination of impulses with reference to ends.

It remains to say a word about the chapter on the nervous system. This seems to the reviewer the least successful portion of the book. It has the defect of being so condensed that it would be exceedingly difficult to students who had had no previous training in the anatomy of the nervous system. Occasionally its extreme condensation produces lack of clearness. If the chapter could have been increased in length, it seems as though it might have been made enough clearer to more than compensate for the additional pages. Its use as it stands would certainly require a great deal to be supplied by the instructor. On one very minor point the most recent data are not given. It quotes the old estimate of the total number of neurones in the nervous system, three thousand millions, whereas the more recent estimate is that there are at least eleven thousand millions.¹ The average volume of the cell-body computed upon this basis differs from the one given. The chapter has, however, the virtue of bringing together the material on the nervous system which it is possible to require of an elementary class, and that is something which had not been done before.

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¹ Donaldson, in Wood's *Reference Hand-Book of the Medical Sciences*, Vol. II, p. 318.